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### ***Research Interests***

The Zundel laboratory examines the molecular mechanisms by which altered extracellular oxygenation mediates diverse effects in mammalian tissues. These responses are serendipitously uncovering novel aspects of basic cellular functions, such as energy metabolism, protein turnover by ubiquitylation, translational arrest, IRES-mediated translational initiation, mRNA stability, and the unfolded protein response. A combination of functional genetics, genomics, and proteomics is utilized to examine the molecular architecture underlying oxygen-sensing and response mechanisms. Lack of oxygen (hypoxia) is a common pathological foundation of many human diseases, such as cancer, pulmonary disorders, aging, cardiac and vascular disorders, diabetes, infection, obesity, and certain aging-related disorders. By defining the molecular responses to hypoxia, it will be possible to target these regulatory pathways with greater specificity. This will ultimately lead to the identification of stage-specific diagnostic and prognostic markers and the development of novel therapies that manipulate these processes.

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